

Antenna Measurement Report

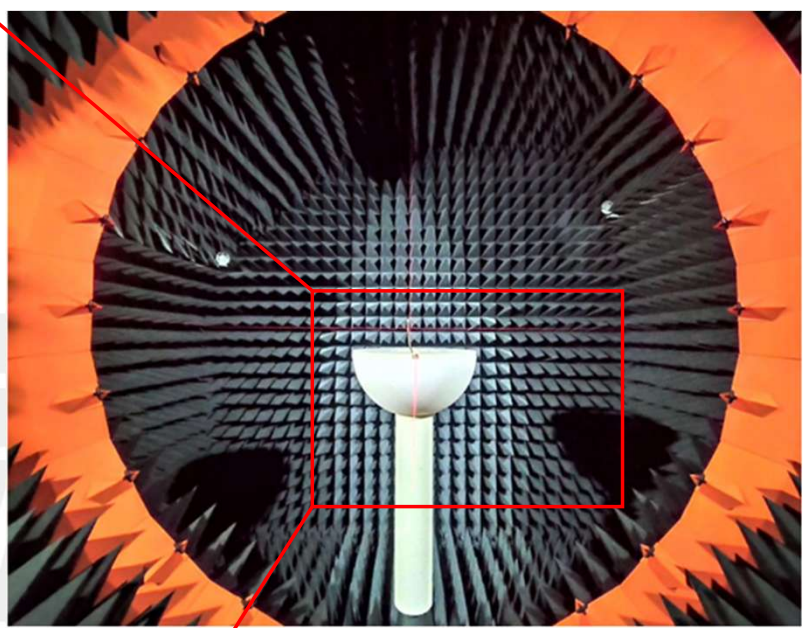


Agenda

- Antenna Testing Environment
- Antenna Test Procedure
- Antenna Location
- Antenna Peak Gain
- UWB 2D Radiation Pattern
- UWB 3D Radiation Pattern
- BLE 2D Radiation Pattern

Antenna testing environment

MVG SATIMO SG24L Anechoic Chamber



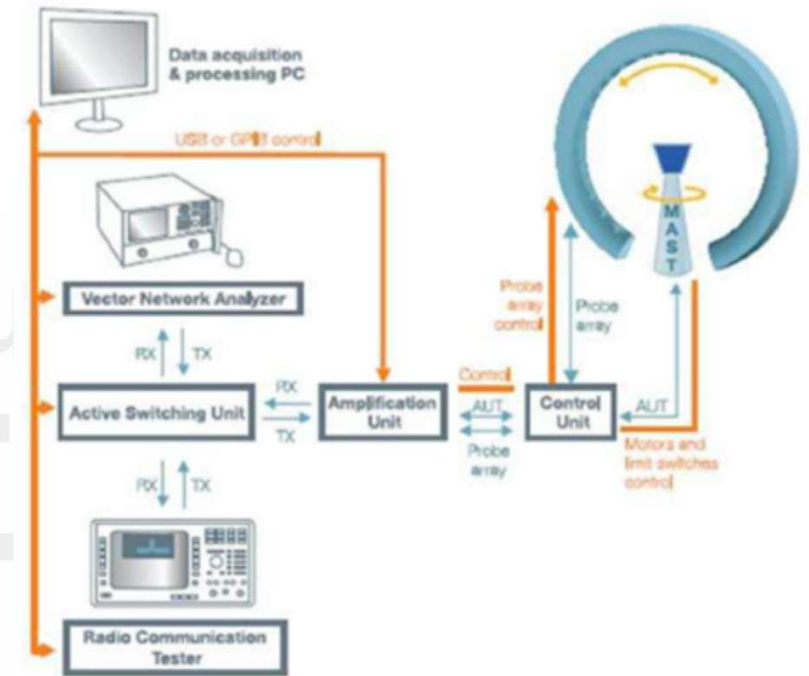
Passive Anechoic Chamber	
Model	SATIMO SG24L
Chamber Size	5 x 5 x 5 M
Frequency Range	0.4 ~ 8.5 GHz
System	23 Multi-Probe / NF to FF
VNA	Keysight E5080B
Maximum AUT Size	1.79 M
Standard Load	50 Kg
Over Sampling	Goniometer, ±7.5°
Certification	CTIA
Measurement Capabilities : Passive Antenna Gain / Directivity / Efficiency / SLL / Phase Center / 2D and 3D Radiation Pattern / ECC.	

Measurement personnel: Mark Lin
Measurement Date: 2026/04/27
SG24L Software: WaveStudio 24.2.4

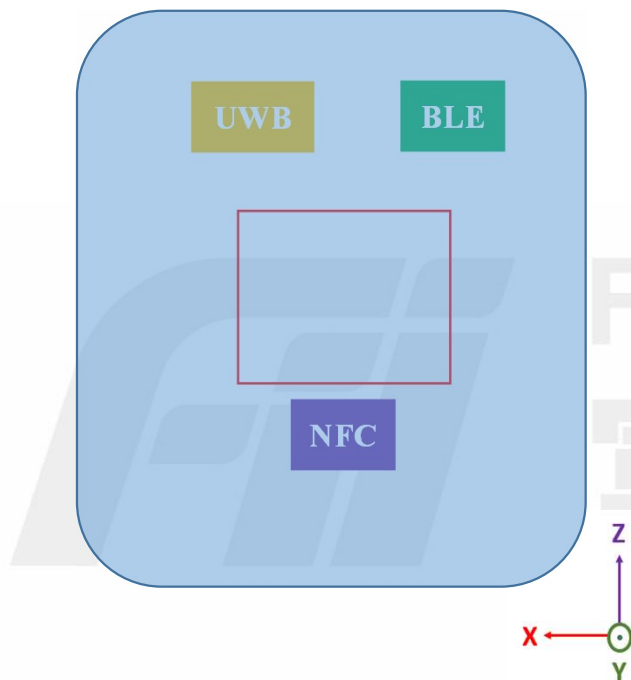
Equipment	Brand	Model	S/N	Calibrated Date
Network Analyzer	Keysight	E5080B	MY59202063	2026/03/31
Chamber	SATIMO	SG-24L	1102058-131	2025/05/19

Antenna Test Procedure

1. Place the device to be tested on the fixture and align it with the center of the chamber.
2. Connect the antenna cable to the RF connector of the chamber.
3. Use the SW to configure parameters (antenna name, frequency points, measurement angles, antenna dimension), and then run the test SW (wave studio).
4. By phi from 0° to 360° and theta from 0° to 180° with a step size of 3 degrees, get the 3D data, including efficiency, peak gain, 2D and 3D radiation patterns.
5. This is far field test for antenna verification.
6. This is passive measurement, which means the device is off and not in any operating mode.

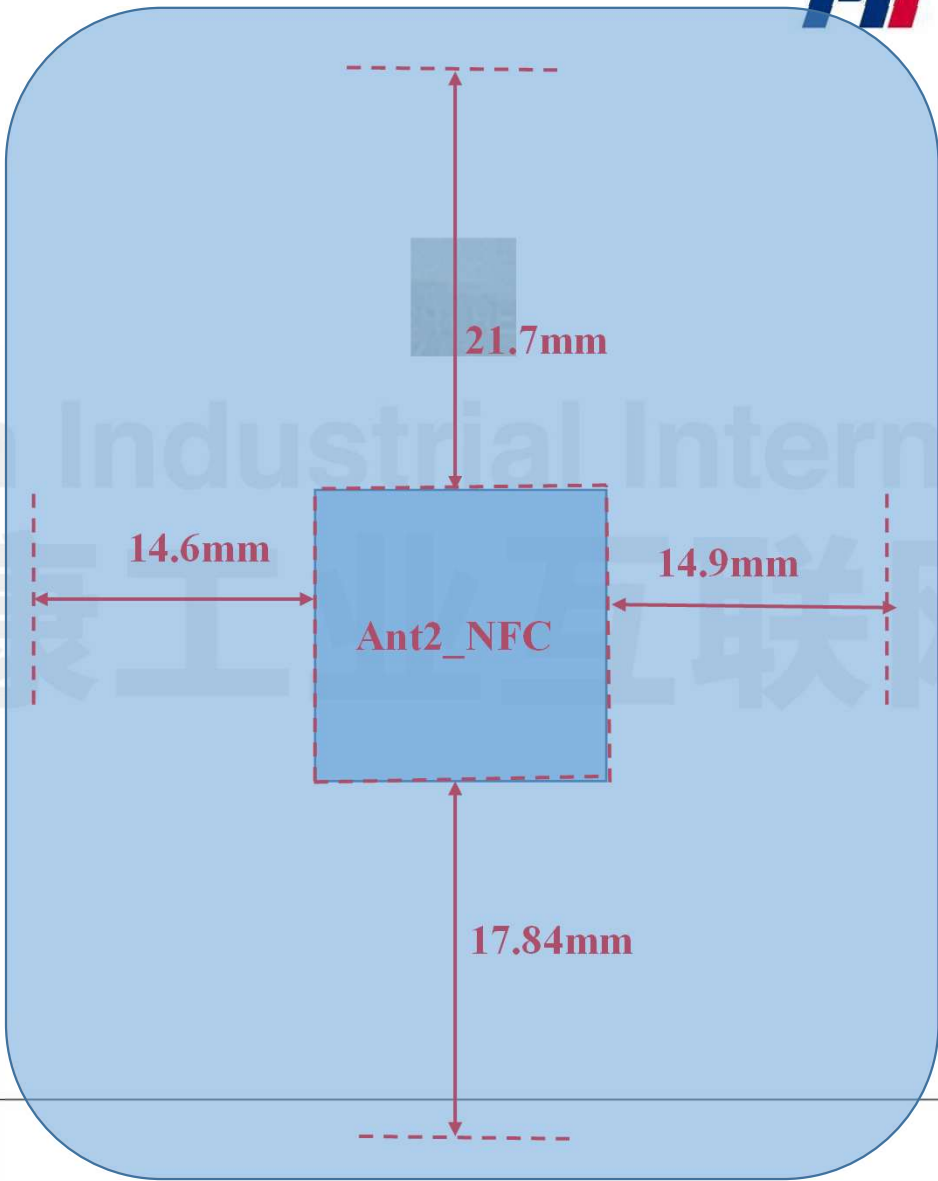
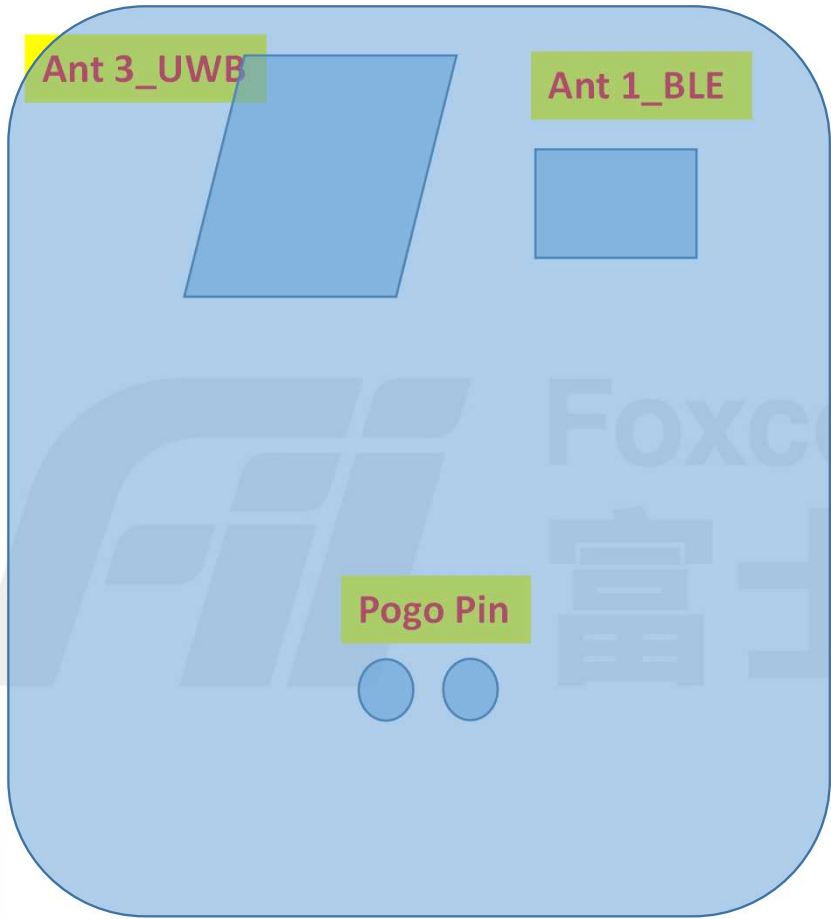


Antenna Sub-system Overview

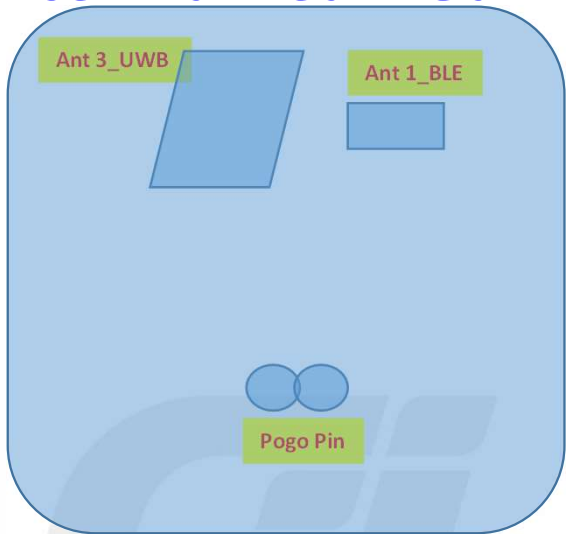


	UWB	BLE	NFC
Working Frequency	7737 – 8236 MHz	2400 – 2500 MHz	13.56MHz
Type	Patch Antenna	Chip Antenna	Loop
Polarization	Linear	Linear	Linear
S-parameter	< -10 dB	< -6dB	N/A
Efficiency	> 46 %	> 47 %	
Communication Distance	N/A	N/A	20mm

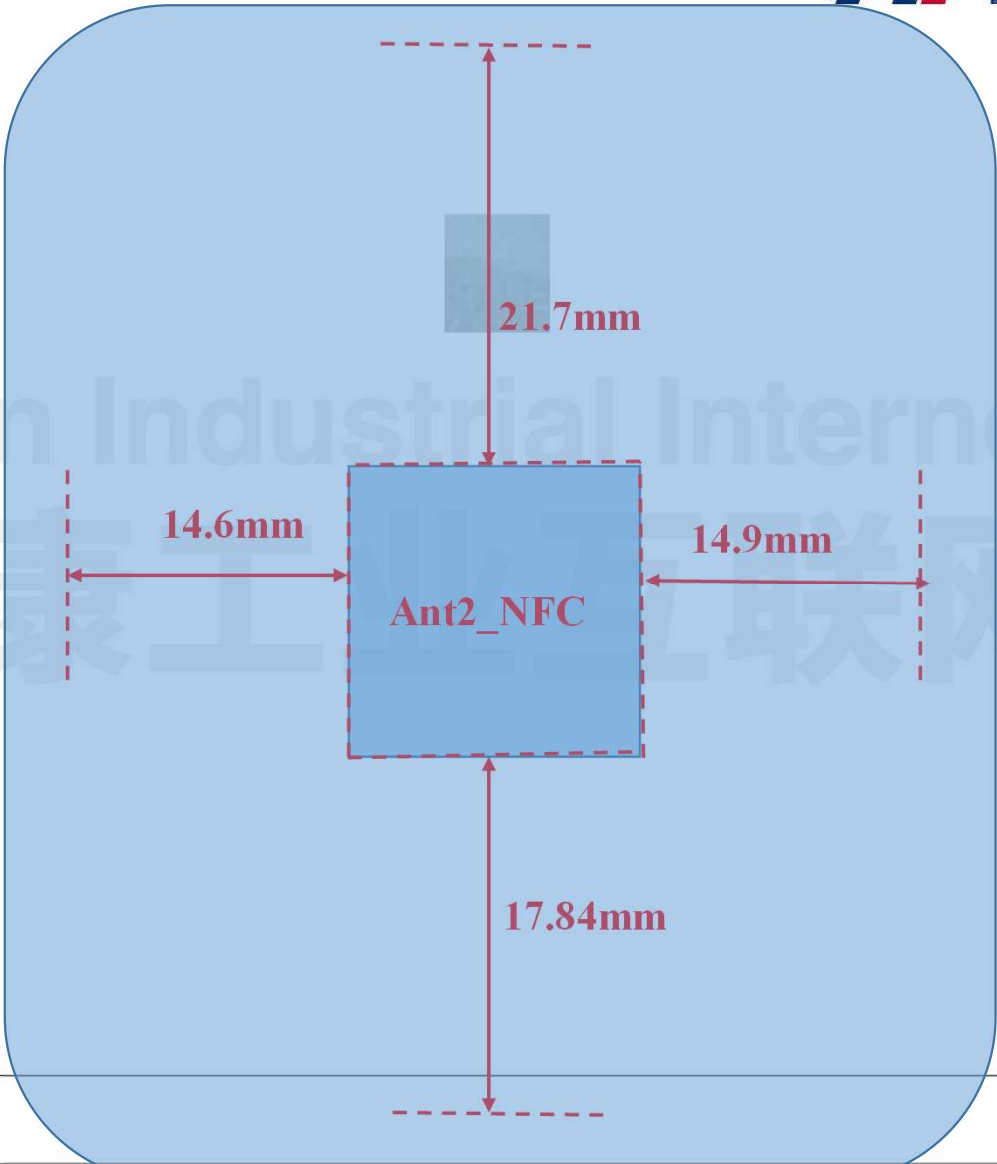
Antenna Location



Antenna Peak Gain (dBi)

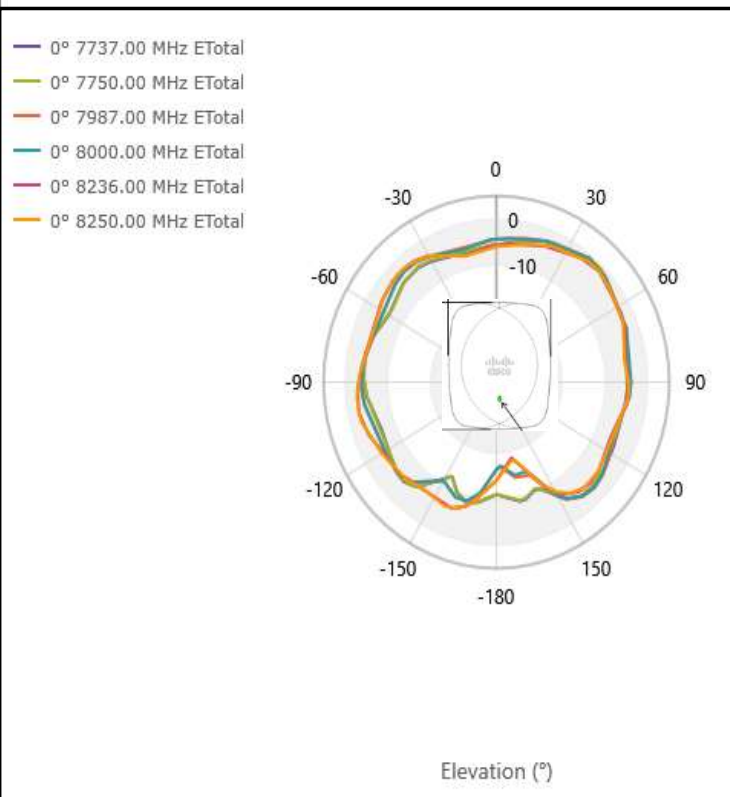


Freq(MHz)	Ant 1_BLE	Ant 3_UWB
2400	1.71	
2450	1.07	
2500	0.16	
7737		1.5
7987		1.7
8236		1.54

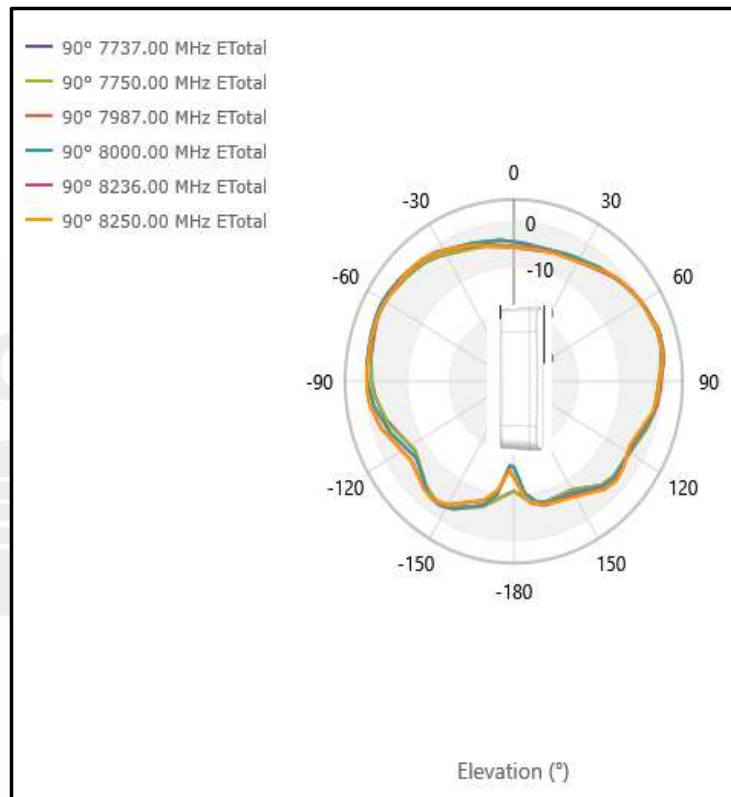


UWB 2D Radiation Pattern

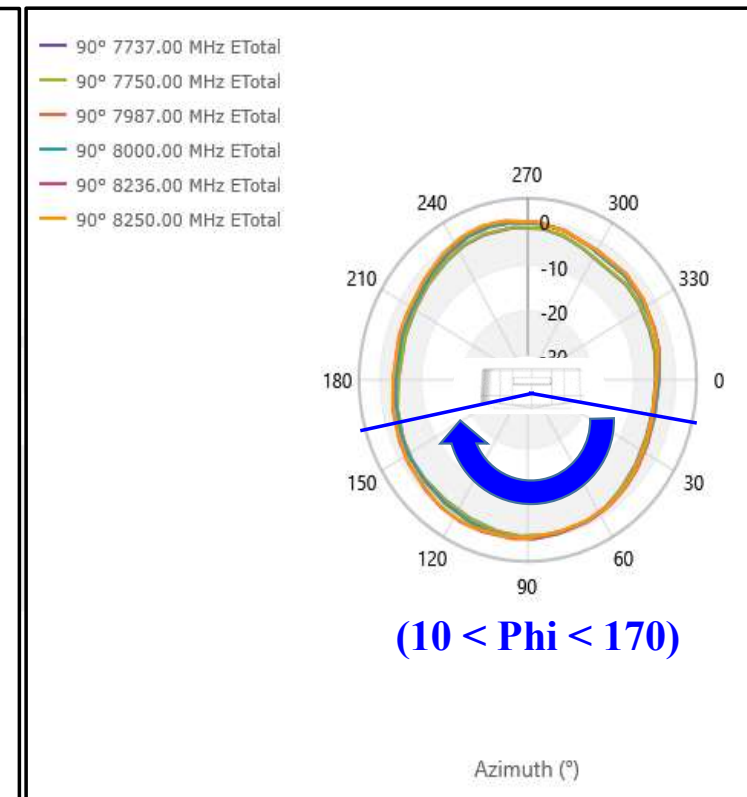
XZ-plane



YZ-plane



XY-plane (theta 90°)



- The azimuth radiation pattern (XY plane) is based on theta 90° for wall mount application. **(10 < Phi < 170)**

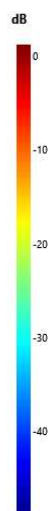
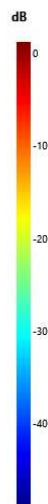
XY-plane	7737MHz	7750MHz	7987MHz	8000MHz	8236MHz	8500MHz
MAX	-0.57	-0.53	0.03	-0.04	0.1	-0.07
MIN	-4.85	-4.75	-4.18	-4.14	-4.63	-4.72
Ripple	4.28	4.22	4.21	4.1	4.73	4.65

UWB 3D Radiation Pattern

7.737GHz

7.750GHz

7.987GHz



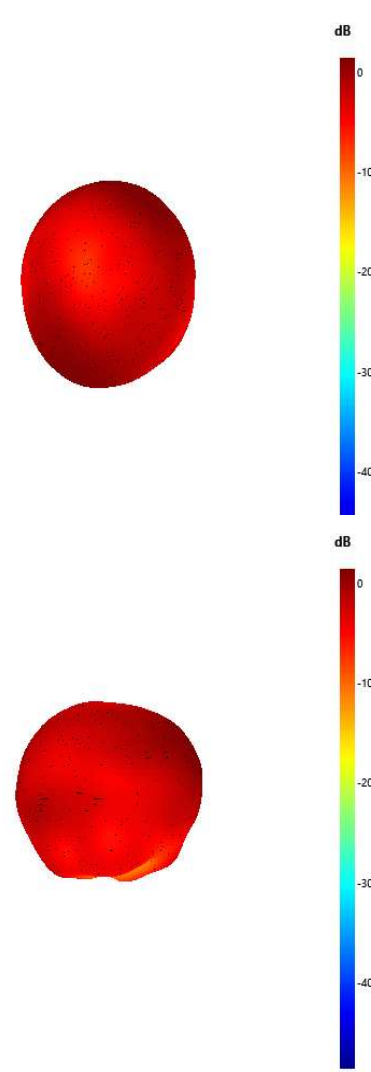
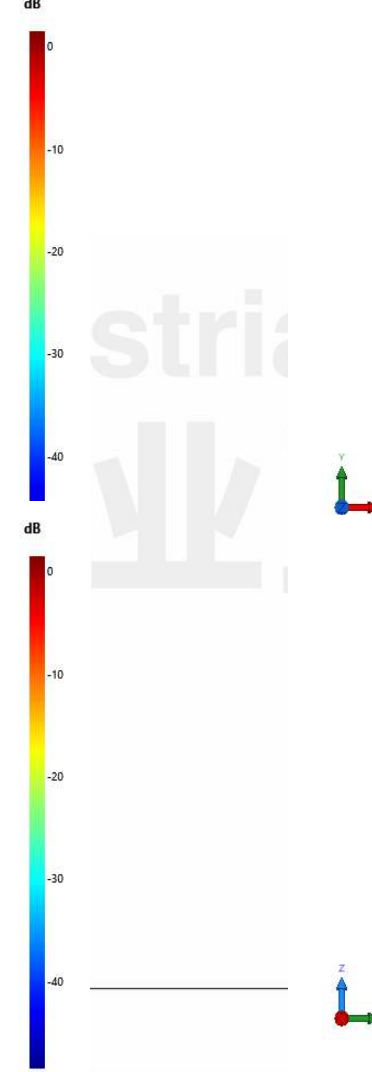
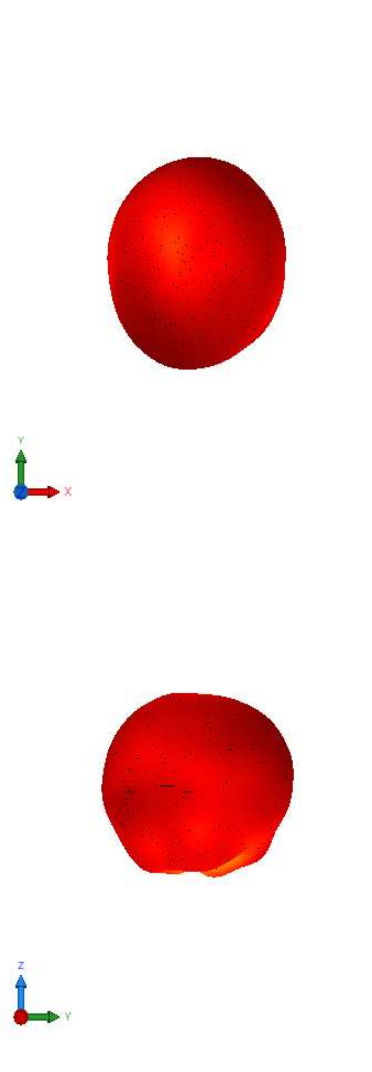
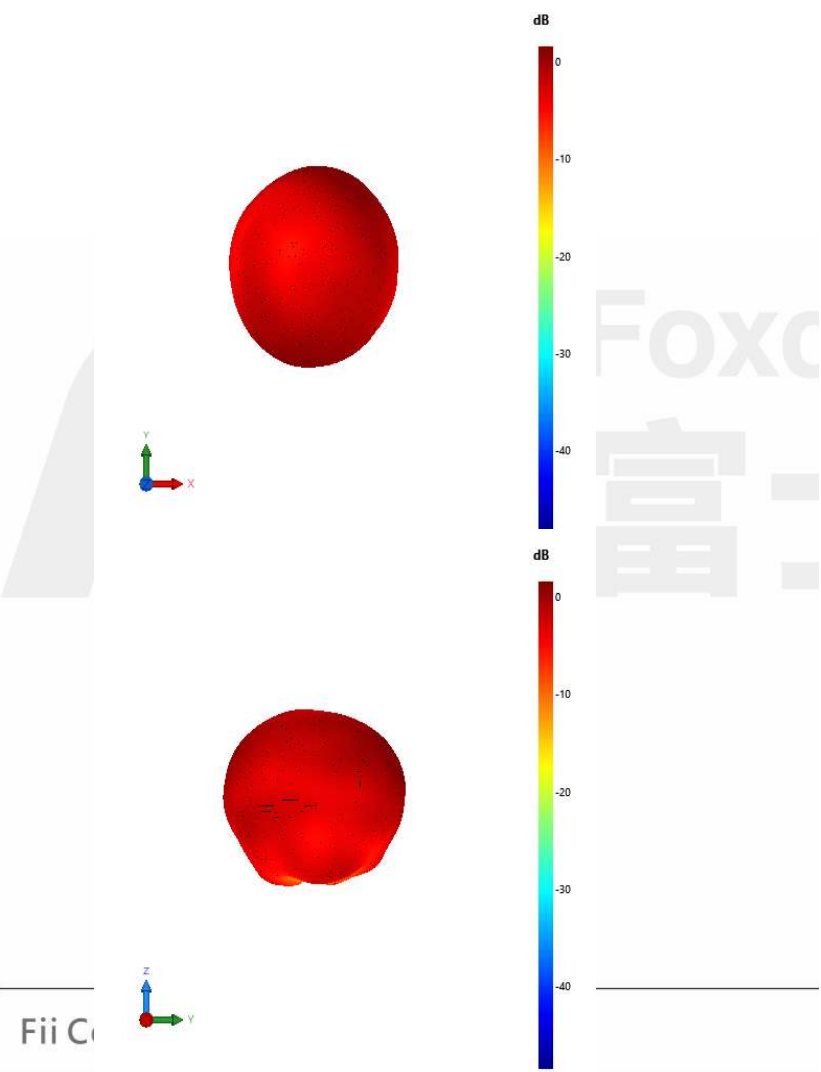
Fii C

UWB 3D Radiation Pattern

8.000GHz

8.236GHz

8.500GHz

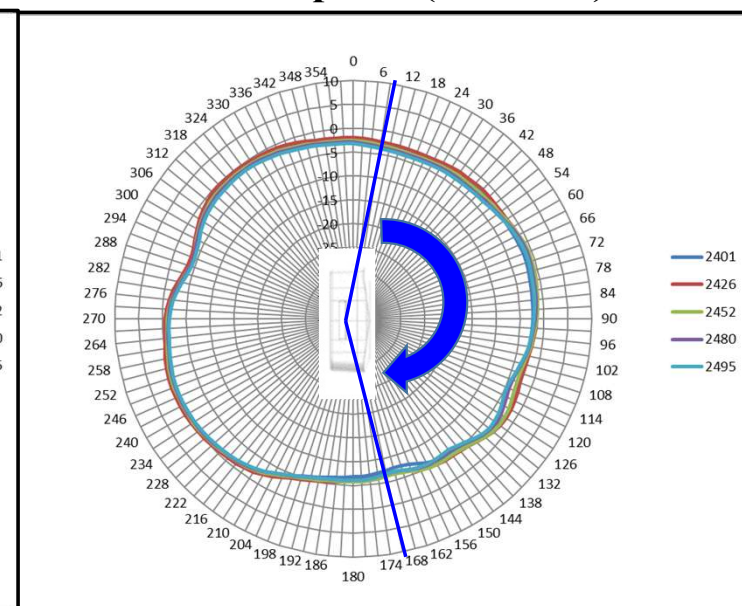
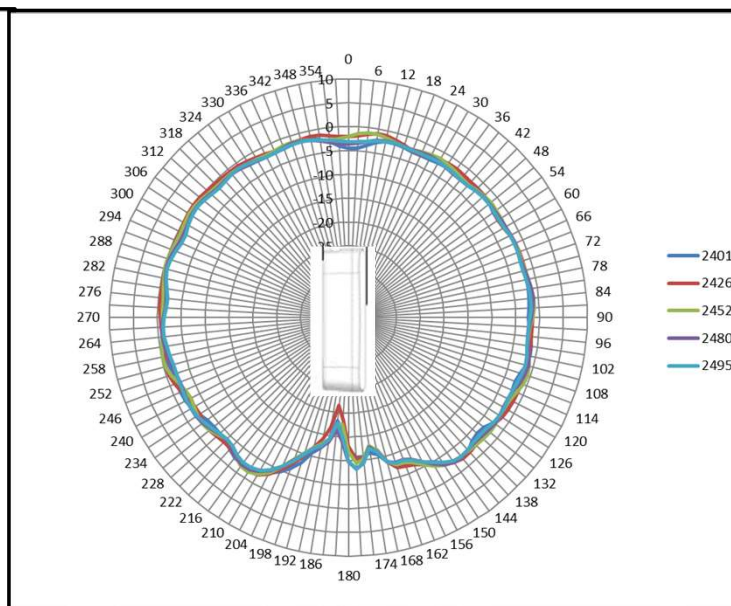
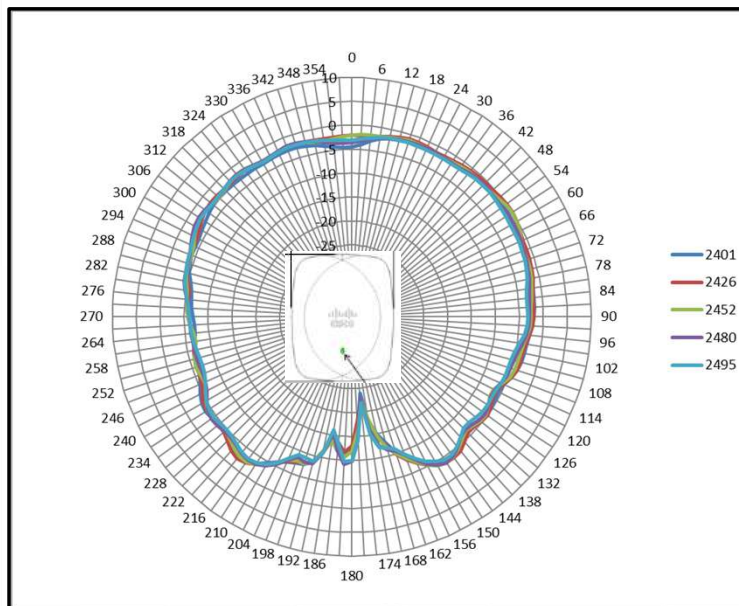


BLE 2D Radiation Pattern

XZ-plane

YZ-plane

XY-plane (theta 90°)



- The azimuth radiation pattern (XY plane) is based on theta 90° for wall mount application. (10 < Phi < 170)

X-Y plane 10°~170°	2401MHz	2426MHz	2452MHz	2480MHz	2495MHz
MAX	-1.77	-0.64	-0.58	-0.93	-1.22
MIN	-7.57	-6.39	-6.28	-6.83	-6.79
Ripple	5.80	5.75	5.71	5.90	5.57

Thank You!



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